

Amendments to the Claims

Please make the following amendments to the Claims:

1. (Currently Amended) An apparatus for automatically selecting a copy function, the apparatus comprising:

an identification module configured to identify one or more available copy functions in response to a data copy request to copy data to a secondary storage device, each copy function compatible with the secondary storage device and available to an application to copy data of the data copy request to the secondary storage device, the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data;

a comparison module configured to compare one or more attributes of each available copy function to corresponding attributes of a predefined copy policy;

a selection module configured to automatically select a copy function that satisfies the predefined copy policy; and

a relationship module configured to establish a copy relationship between the ~~determined~~ selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the data to a secondary storage device,

wherein the identification module, the comparison module, the selection module, and the relationship module comprise at least one of hardware and executable

code, the executable code executable on a processor and stored on one or more computer readable media.

2. (Currently Amended) The apparatus of claim 1, further comprising a policy generation module configured to read a set of required attributes from ~~an~~ the application and to establish the predefined copy policy based on the set of required attributes from the application.
3. (Original) The apparatus of claim 1, further comprising a policy generation module configured to allow a user to determine the predefined copy policy based on a set of required attributes from an application.
4. (Currently Amended) The apparatus of claim 1, wherein the identification module is further configured to determine a set of copy functions compatible with ~~an~~ the application, determine a set of copy functions compatible with a source storage device, where the data of the data request is stored, and ~~a destination~~ the secondary storage device, and to determine ~~the~~ available copy functions that are common to both the set of copy functions compatible with the application and the set of copy functions that are compatible with the source storage device and the ~~destination~~ secondary storage device.
5. (Currently Amended) The apparatus of claim 1, wherein the ~~selection~~ comparison module is further configured to compare one or more ~~a predefined copy policy~~ copy function

attributes of a copy function to a corresponding copy function predefined copy policy attributes, of the predefined copy policy, for each of a group of available copy functions and the selection module is further configured to select a copy function with the a largest number of copy function attributes that satisfy the application predefined copy policy attributes.

6. (Currently Amended) The apparatus of claim 1, wherein the ~~selection~~ comparison module is further configured to calculate a difference between ~~a one or more predefined copy policy function attributes, each configured as a numerical value, and a corresponding predefined copy function policy attributes, each configured as a numerical value, for each of the a group of available copy functions and the selection module is further configured to select a copy function where the differences between the copy function attributes and the predefined copy policy attributes are the smallest.~~
7. (Currently Amended) The apparatus of claim 1, wherein the ~~selection~~ comparison module is further configured to compare ~~a one or more predefined copy policy copy function attributes to a corresponding predefined copy function attributes for each of the available copy functions to determine a score for each attribute of each copy function, to multiply each attribute score by a priority factor to determine an adjusted score, to sum the adjusted scores for each copy function, and the selection module is further configured to select a copy function with a highest sum of adjusted scores.~~

8. (Currently Amended) The apparatus of claim 1, wherein the ~~selection~~ comparison module is further configured to calculate a difference between ~~a one or more predefined copy policy copy function~~ attributes, each configured as a numerical value, and a corresponding copy function predefined copy policy attributes for each of the available copy functions, to multiply each difference by a priority factor to obtain an adjusted difference, to sum the adjusted differences for each copy function, and the selection module is further configured to select a copy function with a ~~highest score~~ lowest sum of adjusted differences.

9. (Currently Amended) An apparatus for automatically selecting a copy function, the apparatus comprising:

a policy generation module configured to establish a copy policy compatible with an application, the copy policy comprising one or more copy policy attributes;
and

a copy request module configured to:

recognize a data copy request that includes the copy policy;

identify one or more available copy functions, each copy function compatible with one or more secondary storage devices and available to the application to copy data to a secondary storage device of the one or more secondary storage devices,

the one or more secondary storage devices available to the application for storing data;
compare attributes of each copy function for a storage device to attributes of the copy policy;
automatically select a copy function that satisfies the copy policy; and
establish a copy relationship between the ~~determined~~ selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the data to a secondary storage device
wherein the policy generation module and the copy request module comprise at least one of hardware and executable code, the executable code executable on a processor and stored on one or more computer readable media.

10. (Original) The apparatus of claim 9, wherein the policy generation module is configured to read a set of required attributes from the application and to establish a copy policy based on the set of required attributes from the application.
11. (Original) The apparatus of claim 9, wherein the policy generation module is configured to allow a user to determine a predefined copy policy based on a set of required attributes from the application.

12. (Currently Amended) The apparatus of claim 9, wherein identifying available copy functions further comprises determining a set of copy functions compatible with ~~an~~ the application, determining a set of copy functions compatible with a source storage device and ~~a destination~~ the secondary storage device, and determining ~~the~~ available copy functions that are common to both the set of copy functions compatible with the application and the set of copy functions that are compatible with the source storage device and ~~the destination~~ secondary storage device.
13. (Currently Amended) The apparatus of claim 9, wherein ~~automatically selecting a copy function~~ comparing attributes of each copy function for a storage device to attributes of the copy policy further comprises comparing ~~a one or more copy policy copy function attributes~~ to a corresponding copy function copy policy attributes, of the predefined copy policy, for each of a group of available copy functions and automatically selecting a copy function further comprises selecting a copy function with ~~the~~ a largest number of copy function attributes that satisfy ~~the application~~ predefined copy policy attributes.
14. (Currently Amended) The apparatus of claim 9, wherein ~~automatically selecting a copy function~~ comparing attributes of each copy function for a storage device to attributes of the copy policy further comprises calculating a difference between ~~a one or more copy policy function attributes~~ each configured as a numerical value, and ~~a corresponding predefined copy function policy attributes~~ each configured as a numerical value, for each

of the available copy functions and automatically selecting a copy function further comprises selecting a copy function where ~~the~~ differences between the copy function attributes and the predefined copy policy attributes are the smallest.

15. (Currently Amended) The apparatus of claim 9, wherein ~~automatically selecting a copy function~~ comparing attributes of each copy function for a storage device to attributes of the copy policy further comprises comparing ~~a one or more copy policy function~~ attributes, each configured as a numerical value, to a corresponding predefined copy function policy attributes, each configured as a numerical value, for each of the available copy functions, determining a score for each attribute of each copy function, multiplying each ~~score attribute~~ score by a priority factor to determine an adjusted score, summing the adjusted scores for each copy function, and automatically selecting a copy function further comprises selecting a copy function with a highest sum of adjusted scores.
16. (Currently Amended) The apparatus of claim 9, wherein ~~automatically selecting a copy function~~ comparing attributes of each copy function for a storage device to attributes of the copy policy further comprises calculating a difference between ~~a one or more copy policy function~~ attributes, each configured as a numerical value, and a corresponding copy function policy attributes, each configured as a numerical value, for each of the available copy functions, multiplying each difference by a priority factor to obtain an adjusted difference, summing the adjusted differences for each copy function, and

automatically selecting a copy function further comprises selecting a copy function with a highest score lowest sum of adjusted differences.

17. (Currently Amended) A system for automatically selecting a copy function, the system comprising:

a file server comprising

an application module configured to send a data copy request from an application;

an identification module configured to identify one or more available copy functions in response to a data copy request ~~that includes a predefined copy policy~~ to copy data to a secondary storage device, each copy function compatible with the secondary storage device and available to the application to copy data of the data copy request to the secondary storage device, the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data;

a comparison module configured to compare one or more attributes of each available copy function to corresponding attributes of ~~the~~ a predefined copy policy;

a selection module configured to automatically select a copy function that satisfies the predefined copy policy;

a relationship module configured to establish a copy relationship between the ~~determined~~ selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the data to a secondary storage device.[];

~~a source storage module configured to store data from the application module; and~~

~~a destination storage module configured to store data copied from the source storage module in response to the data copy request using the selected copy function.~~

18. (Currently Amended) The system of claim 17, further comprising a policy generation module configured to read a set of required attributes from ~~an~~ the application and to establish a predefined copy policy based on the set of required attributes from the application.
19. (Original) The system of claim 17, further comprising a policy generation module configured to allow a user to determine a predefined copy policy based on a set of required attributes from an application.

20. (Currently Amended) The system of claim 17, wherein the identification module is further configured to determine a set of copy functions compatible with ~~an~~ the application, determine a set of copy functions compatible with a source storage device, where the data of the data request is stored, and ~~a destination~~ the secondary storage device, and to determine ~~the~~ available copy functions that are common to both the set of copy functions compatible with the application and the set of copy functions that are compatible with the source storage device and ~~the destination~~ secondary storage device.
21. (Currently Amended) The system of claim 17, wherein the ~~selection~~ comparison module is further configured to compare ~~a one or more predefined~~ copy-policy function attributes to a corresponding predefined copy-function policy attributes, of the predefined copy policy, for each of a group of available copy functions and the selection module is further configured to select a copy function with ~~the~~ a largest number of copy function attributes that satisfy the ~~application~~ predefined copy policy attributes.
22. (Currently Amended) The system of claim 17, the ~~selection~~ comparison module is further configured to calculate a difference between ~~a one or more predefined~~ copy-policy function attributes, each configured as a numerical value, and ~~a corresponding predefined~~ copy-function policy attributes, each configured as a numerical value, for each of ~~the~~ a group of available copy functions and the selection module is further configured to select

a copy function where ~~the~~ differences between the copy function attributes and the predefined copy policy attributes are the smallest.

23. (Currently Amended) The system of claim 17, wherein the ~~selection~~ comparison module is further configured to compare ~~a one or more predefined copy policy~~ copy function attributes ~~to a~~ corresponding predefined copy function attributes for each of the available copy functions to determine a score for each attribute of each copy function, to multiply each ~~attribute~~ score by a priority factor to determine an adjusted score, to sum the adjusted scores for each copy function, and the selection module is further configured to select a copy function with a highest sum of adjusted scores.
24. (Currently Amended) The system of claim 17, wherein the ~~selection~~ comparison module is further configured to calculate a difference between ~~a one or more predefined copy policy~~ copy function attributes, each configured as a numerical value, and ~~a corresponding copy function~~ predefined copy policy attributes for each of the available copy functions, to multiply each difference by a priority factor to obtain an adjusted difference, to sum the adjusted differences for each copy function, and the selection module is further configured to select a copy function with a ~~highest score~~ lowest sum of adjusted differences.

25. (Currently Amended) A method for automatically selecting a copy function, the method comprising:

identifying one or more available copy functions in response to a data copy request that includes a predefined copy policy, the data copy request to copy data to a secondary storage device, each copy function compatible with the secondary storage device and available to an application to copy data of the data copy request to the secondary storage device, the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data;

comparing one or more attributes of each available copy function to corresponding attributes of the predefined copy policy;

automatically selecting a copy function that satisfies the predefined copy policy; and

establishing a copy relationship between the ~~determined~~ selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the data to a secondary storage device.

26. (Currently Amended) The method of claim 25, further comprising reading a set of required attributes from ~~an~~ the application and establishing a predefined copy policy based on the set of required attributes from the application.

27. (Original) The method of claim 25, further comprising allowing a user to determine a predefined copy policy based on a set of required attributes from an application.
28. (Currently Amended) The method of claim 25, identifying available copy functions further comprises determining a set of copy functions compatible with ~~an~~ the application, determining a set of copy functions compatible with a source storage device, where the data of the data request is stored, and a destination ~~the~~ secondary storage device, and determining ~~the~~ available copy functions that are common to both the set of copy functions compatible with the application and the set of copy functions that are compatible with the source storage device and the ~~destination~~ secondary storage device.
29. (Currently Amended) The method of claim 25, wherein comparing one or more attributes of each available copy function ~~for the storage device to objectives~~ corresponding attributes of the predefined copy policy further comprises comparing ~~a one or more predefined policy copy function attributes to a corresponding predefined copy function~~ policy attributes, of the predefined copy policy, for each of a group of available copy functions and automatically selecting a copy function that satisfies the predefined copy policy further comprises selecting a copy function with ~~the~~ a largest number of copy function attributes that meet the ~~application~~ predefined copy policy attributes.

30. (Currently Amended) The method of claim 25, wherein comparing one or more attributes of each available copy function for the storage device to objectives corresponding attributes of the predefined copy policy further comprises calculating a difference between a one or more predefined copy policy copy function attributes, each configured as a numerical value, and a corresponding predefined copy function policy attributes, each configured as a numerical value, for each of the available copy functions and automatically selecting a copy function that satisfies the predefined copy policy further comprises selecting a copy function where ~~the~~ differences between the copy function attributes and the predefined copy policy attributes are the smallest.
31. (Currently Amended) The method of claim 25, wherein comparing one or more attributes of each available copy function for the storage device to objectives corresponding attributes of the predefined copy policy further comprises comparing a one or more predefined copy policy copy function attributes to a corresponding predefined copy function policy attributes for each of the available copy functions, determining a score for each attribute of each copy function, multiplying each ~~attribute~~ score by a priority factor to determine an adjusted score, summing the adjusted scores for each copy function, and automatically selecting a copy function that satisfies the predefined copy policy further comprises selecting a copy function with a highest sum of adjusted scores.

32. (Currently Amended) The method of claim 25, wherein comparing one or more attributes of each available copy function for the storage device to objectives corresponding attributes of the predefined copy policy further comprises calculating a difference between a one or more copy function predefined copy policy attributes, each configured as a numerical value, and a corresponding predefined copy function policy attribute s, each configured as a numerical value, for each of the available copy functions, multiplying each difference by a priority factor to obtain an adjusted difference, summing the adjusted differences for each copy function, and automatically selecting a copy function that satisfies the predefined copy policy further comprises selecting a copy function with a ~~highest score~~ lowest sum of adjusted differences.

33. (Cancelled)

34. (Cancelled)

35. (Cancelled)

36. (Cancelled)

37. (Cancelled)

38. (Currently Amended) A computer readable storage medium comprising computer readable code configured to carry out a method for automatically selecting a copy function, the method comprising:

identifying one or more available copy functions in response to a data copy request that includes a predefined copy policy, the data copy request to copy data to a secondary storage device, each copy function compatible with the secondary storage device and available to an application to copy data of the data copy request to the secondary storage device, the secondary storage device comprising one of one or more secondary storage devices available to the application for storing the data;

comparing one or more attributes of each available copy function to corresponding attributes of the predefined copy policy;

automatically selecting a copy function that satisfies the predefined copy policy; and

establishing a copy relationship between the ~~determined~~ selected copy function and the data copy request, the copy relationship configured to use the selected copy function to copy the data to a secondary storage device.

39. (Currently Amended) The computer readable storage medium of claim 38, wherein identifying available copy functions further comprises determining a set of copy functions compatible with ~~an~~ the application, determining a set of copy functions compatible with a source storage device, where the data of the data request is stored, and a destination the

secondary storage device, and determining ~~the~~ available copy functions that are common to both the set of copy functions compatible with the application and the set of copy functions that are compatible with the source storage device and the ~~destination~~ secondary storage device.

- 40. (Cancelled)
- 41. (New) The apparatus of claim 1, wherein a predefined copy policy attribute within the predefined copy policy comprises a recovery point objective (“RPO”), wherein an RPO comprises an amount of data lost over a period of time.
- 42. (New) The apparatus of claim 1, wherein a predefined copy policy attribute within the predefined copy policy comprises a recovery time objective (“RTO”), wherein an RTO comprises an amount of time to recover data to a usable condition.
- 43. (New) The apparatus of claim 1, wherein a predefined copy policy attribute within the predefined copy policy comprises a distance to a secondary site where the secondary storage device is stored.
- 44. (New) The apparatus of claim 1, wherein a predefined copy policy attribute within the predefined copy policy comprises a consistency, wherein a consistency comprises a determination of dependency on other stored data.

45. (New) The apparatus of claim 1, wherein a predefined copy policy attribute within the predefined copy policy comprises an application impact, wherein an application impact comprises a performance impact caused by a copy function to the application, the performance impact measured in a unit of time.